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The author observes, that many singular facts have occurred in the course of his researches, some of which bear upon general science. Weak solutions of salt act strongly upon copper, but strong ones do not affect it, apparently because they contain little air, the oxygen of which seems necessary to give the electro-positive power to these menstrea; upon the same principle, alkaline solutions and lime-water prevent the action of sea-water on copper, having in themselves the positive electrical energy which renders the copper negative.

The author concludes this paper with some further applications of electro-chemical theory to the subject of it, and refers to the principles developed, as suggesting means of preserving instruments of brass and of steel, by iron and by zinc,—a circumstance already taken advantage of by Mr. Pepys, in inclosing delicate cutting instruments in handles or cases lined with zinc.

On the apparent Direction of Eyes in a Portrait. By William Hyde Wollaston, M.D. F.R.S. and V.P. Read May 27, 1824. [*Phil. Trans.* 1824, p. 247.]

When we consider, says the author, the precision with which we commonly judge whether the eyes of another person are fixed upon ourselves, it is surprising that the grounds of such judgement are not distinctly known, and that most persons in attempting to explain the subject would overlook some of the circumstances by which they are generally guided. Though it may not be possible to demonstrate, by any decisive experiment, on the eyes of living persons what those circumstances are, we may find convincing arguments to prove their influence, if it can be shown in the case of portraits, that the same ready decision that we pronounce on the direction of the eyes is founded, in great measure, on the view presented to us of parts which have not been considered as assisting our judgement.

Dr. Wollaston then adverts to the influence of the form of the iris, as announcing the direction of the eye in portraits, and to that of the variable portion of the white shown when the eye is variously directed in living persons: he remarks, however, that even in real eyes we are not guided by this circumstance alone, but are unconsciously aided by the concurrent position of the face; and he illustrates this opinion by reference to a series of drawings annexed to the paper, and which show that the apparent position of the eyes is principally influenced by that of the adjacent parts of the face, especially those which are most prominent; and these considerations are not limited in their application merely to cases of lateral turn of the eyes and face. But the same principles also apply to instances of moderate inclination of the face upwards or downwards; for when the face is directed downwards, the eyes that look at us must be turned upwards, from the position of the face to which they belong; and if to eyes so drawn an upward cast of features be substituted for the former, the eyes immediately look above us, as is found by a sketch

annexed. From these and other details given in the paper, the author concludes that the apparent direction of the eyes to or from the spectator, depends upon the balance of two circumstances combined in the same representation ; namely, 1st, the general position of the face presented to the spectator ; 2nd, the turn of the eyes from that position ; and thence proceeds to examine why, if the eyes of a portrait look at the spectator placed in front of the picture, they appear to follow him in every other direction. When two objects are seen on the ground at different distances from us in the same direction, one appears and must be represented exactly above the other, so that a vertical plane from the eye would pass through them ; and since such a line will be seen upright, however far we remove to one side, it follows that the same objects still seem to be in a line with us exactly as in the front view, seeming as we move to turn from their first direction.

In portraits the permanence of direction, with reference to the spectator, and corresponding change of its apparent position in space when he moves to either side, depends upon the same principles. The nose drawn in front, with its central line upright, continues directed to the spectator, though viewed obliquely ; or if the right side of the nose is represented, it must appear directed to the right of the spectator in all situations ; so that eyes that turn in a due degree from that direction towards the spectator, so as to look at him when viewed in front, will continue to do so when viewed obliquely.

Further Particulars of a Case of Pneumato-thorax. By John Davy, M.D. F.R.S. Read March 4, 1824. [*Phil. Trans.* 1824, p. 257.]

About a month after the operation described in Dr. Davy's former paper, when the patient appeared to be doing well, symptoms of hydrothorax came on, and fluid again collected in the left side of the chest. A second operation therefore was performed, and fourteen ounces of fluid discharged through a perforation in the fifth rib. During the six following weeks not less than twenty pints of fluid ran off through the opening ; at first it was transparent, but became gradually more and more purulent, and was mixed with air composed of oxygen, azote and carbonic acid, in various proportions. The patient's health improved at first progressively, but in about six weeks after the operation he became worse, and expired suddenly. On examination after death, about six ounces of pus were found in the left pleura. The right pleura was healthy, but tubercles and vomicae were found in the right lung ; the left lung was much condensed, and communicated by two small openings with the pleura. Dr. Davy refers the origin of the disease in this case to a communication between the aspera arteria and cavity of the pleura, established by the rupture of a superficial bronchial tube, and the membrane covering it ; and concludes the paper with some remarks upon the fluctuating composition of the air from the chest, which he attributes not to the varying quantity of atmospheric air, admitted through the perfora-